

What is claimed is:

1. A method comprising:

varying the power of an input signal to an outphasing system at a first range of output power values; and

- 5 adjusting a phase of said outphasing system at a second range of output power values.

2. The method of claim 1, wherein said outphasing system has shunt reactance.

3. A method comprising:

- 10 varying the power of an input signal to a power amplifier when a desired output power is below a threshold; and

performing outphasing when said desired output power is at said threshold and above said threshold.

4. The method of claim 3, wherein said power amplifier includes an outphasing system with shunt reactance having a variable phase, said varying comprises:

setting said variable phase to a fixed value; and

reducing the power of the input signal.

5. The method of claim 4, wherein said outphasing system with shunt reactance has a peak efficiency at an upper power at a first value of said variable phase and at a lower power at a second value of said variable phase, wherein said threshold is said lower power and said fixed value is said second value.

6. The method of claim 4, wherein the outphasing system is operably coupled to at least one of a radio frequency (RF) preamplifier and

to an intermediate frequency (IF) amplifier and said varying comprises:

lowering a gain of at least one of said RF preamplifier and said IF amplifier.

5 7. The method of claim 4, wherein said variable phase is a collection of discrete phase values.

8. The method of claim 7, wherein said outphasing system with shunt reactance has a peak efficiency at an upper power at a first value of said variable phase and at a lower power at a second value of said variable phase, wherein said threshold is said lower power and said fixed value is said second value.

9. The method of claim 7, wherein said outphasing system is operably coupled to at least one of a radio frequency (RF) preamplifier and to an intermediate frequency (IF) amplifier and said varying comprises:

lowering a gain of at least one of said RF preamplifier and said IF amplifier.

10. A method comprising
providing a first method of power control for a desired output power at a first range of power values which is below a threshold; and
providing a second method of power control for a desired output power at a second range of power values which is above or at said threshold.

11. The method of claim 10, wherein said first method is reducing the power of an input signal to said power amplifier and said second method is outphasing.
12. The method of claim 11, wherein said outphasing is setting at least one phase value from a collection of discrete phase values.
13. The method of claim 10, wherein said first method is reducing the power of an input signal to said power amplifier and said second method is outphasing and reducing the power of the input signal.
14. The method of claim 12, wherein said outphasing is setting at least one phase value from a collection of discrete phase values.
15. A method comprising:
modifying the amplitude of an input signal to an outphasing system with shunt reactance.
16. The method of claim 15, wherein said outphasing system is operably coupled to at least one of a radio frequency (RF) preamplifier and to an intermediate frequency (IF) amplifier and said modifying comprises:
adjusting a gain of at least one of said RF preamplifier and said IF amplifier.
17. A method comprising:
modifying the amplitude of input to at least one of two branch amplifiers of an outphasing system with shunt reactance.
18. The method of claim 17, wherein a first of said two branch amplifiers is operably coupled to a first radio frequency preamplifier and a second of said two branch amplifiers is

operably coupled to a second radio frequency preamplifier and
said modifying comprises:

adjusting a gain of said first radio frequency preamplifier and
adjusting a gain of said second radio frequency preamplifier.

5 19. A method comprising:

modifying the input to an outphasing system with shunt reactance;
and

performing bias control in said outphasing system with shunt
reactance.

10 20. The method of claim 19, wherein said performing comprises:

reducing an internal bias current of at least one branch amplifier in
said outphasing system with shunt reactance.

21. The method of claim 19, wherein said performing comprises:

15 reducing a supply voltage of at least one branch amplifier in said
outphasing system with shunt reactance.

22. A radio frequency (RF) power amplifier comprising:

20 a controller coupled to an outphasing system to provide a variation
of the power of an input signal to said outphasing system at a first
range of output power values and to provide an adjustment of a phase
of the outphasing system at a second range of output power.

23. The RF power amplifier of claim 22, wherein said outphasing
system further comprises a shunt reactance.

24. A radio frequency (RF) power amplifier comprising:

25 a controller coupled to an outphasing system to provide a variation
of the power of an input signal to said outphasing system when a

desired output power is below a threshold and said controller performs outphasing when said desired output power is at said threshold and above said threshold.

5 25. The RF power amplifier of claim 24, wherein said outphasing system further comprises a shunt reactance and at least two phase shifters and wherein said controller is coupled to said phase shifters to provide each of said phase shifters with a phase value.

10 26. The RF power amplifier of claim 25, wherein said outphasing system has a peak efficiency at an upper power and at a lower power, wherein said threshold is said lower power.

15 27. The RF power amplifier of claim 25, wherein said outphasing system is operably coupled to at least one of a radio frequency (RF) preamplifier and to an intermediate frequency (IF) amplifier and said controller is coupled to at least one of said RF preamplifier and said IF amplifier to provide an adjustment of a gain of said at least one of said RF preamplifier and said IF amplifier.

20 28. The RF power amplifier of claim 24, wherein said outphasing system comprises at least two phase shifters and said controller is coupled to said at least two phase shifters to provide a collection of discrete phase values to said at least two phase shifters.

29. The RF power amplifier of claim 28, wherein said outphasing system comprises a shunt reactance and has a peak efficiency at

an upper power and at a lower power, wherein said threshold is said lower power.

30. The RF power amplifier of claim 28, wherein the outphasing system is operably coupled to at least one of a radio frequency (RF) preamplifier and to an intermediate frequency (IF) amplifier and said controller is coupled to at least one of said RF preamplifier and said IF amplifier to provide an adjustment of a gain of at least one of said RF preamplifier and IF amplifier.

31. A radio frequency (RF) power amplifier comprising:

a controller operably coupled to at least one of a radio frequency (RF) preamplifier and to an intermediate frequency (IF) amplifier and to an outphasing system with shunt reactance to provide a modification of the amplitude of an input signal to said outphasing system.

32. The RF power amplifier of claim 31, wherein said outphasing system with shunt reactance comprises:

a splitter operably coupled to at least two RF preamplifiers;

at least two phase shifters each operably coupled to a respective one of said at least two RF preamplifiers; and

at least two branch amplifiers each operably coupled to a respective one of said at least two phase shifters;

wherein said controller is operably coupled to at least one of said at least two RF preamplifiers to provide a gain modification of said at least one of said at least two RF preamplifiers.

33. A radio frequency (RF) power amplifier comprising:

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

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